



UNITED STATES DEPARTMENT OF COMMERCE
National Telecommunications and
Information Administration
Washington, D. C. 20230

February 8, 1995

Mr. Richard M. Smith, Chief
Office of Engineering and Technology
Federal Communications Commission
2000 M Street NW.
Washington, DC 20554

Re: Amendment of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio
Frequencies Above 40 GHz for New Radio Applications
(ET Docket No. 94-124)

Dear Mr. Smith *Dick*

The National Telecommunications and Information Administration (NTIA) is writing to inform you of its views on the Commission's recent Notice of Proposed Rulemaking proposing to open for commercial development and use a portion of the "millimeter wave" frequency bands above 40 GHz.¹ In particular, the Commission proposes to make available 16 GHz of spectrum in the frequency range between 47.2 and 153 GHz on a shared basis with Federal government users, and two GHz in the 40.5 to 42.5 GHz band for non-Federal users.² The potential use of spectrum above 40 GHz by commercial entities using the flexible approach proposed by the Commission will ensure the efficient use of the spectrum resource and encourage innovation. It is also of significant interest to NTIA due to major Federal investments in many of these bands, as well as the consequent need for continued and expanded Federal use of these bands.

In the past, the millimeter wave frequencies were not desirable for commercial use due to the high cost associated with the manufacture of equipment that would operate in these bands. Due to advances in semiconductor technology, equipment costs are now declining and new Federal and non-Federal applications are emerging. Commercial use of these bands will permit the development of short-range wireless radio systems with greater capabilities than are currently feasible. These developments will benefit a large variety of users, including the Federal government.

¹ Amendment of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, Notice of Proposed Rulemaking, ET Docket No. 94-124, 9 FCC Rcd 7078 (released Nov. 8, 1994) [hereinafter Notice]. Frequency bands between 30 GHz and 300 GHz are referred to as the "millimeter wave" bands because the wavelength of radio signals on these frequencies ranges between 1 and 10 millimeters.

² Currently the spectrum addressed in the Notice is shared on a co-primary basis for Federal and non-Federal services.

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NTIA commends the Commission for its flexible proposal to retain in the licensed millimeter wave bands the full range of services presently allowed in the spectrum allocation table.³ The Commission's proposal is a step in the direction advanced by NTIA in its 1991 recommendation that the Commission experiment with "user flexibility" in frequencies above 10 GHz. In its report, U.S. Spectrum Management Policy: Agenda for the Future, NTIA explored the benefits of such experiments, stating:

Applying such principles of flexibility to licensed uses would require a shift in thinking in spectrum management. Systems would not be licensed according to a set of technical and service rules, but would be accommodated according to other users' "interference rights."⁴

NTIA also pledged in its spectrum policy report to work with the Commission in carrying out such proposals for user flexibility. NTIA stands ready to assist the Commission in further addressing user flexibility and other concerns related to the Commission's proposed rules for use of spectrum above 40 GHz. Many difficult issues must be resolved with respect to the Commission's proposal, particularly because the spectrum is shared with Federal users. We believe that the Commission should pay particular attention to the following issues with respect to Federal use of the proposed bands:

First, the Commission's rules should ensure that sufficient spectrum in the millimeter wave bands are maintained for existing and future Federal use. While the Notice states that most of the bands the Commission is proposing to open for commercial use will continue to be available for existing and future Federal use,⁵ the Notice also seeks comment on the possibility of excluding Federal operations or eliminating requirements for coordination with Federal users in some shared spectrum.⁶ While Federal agencies may be flexible with regard to some bands, in certain other bands there are significant Federal operations serving important national interests and involving substantial investments of U.S. taxpayer dollars, which must be protected. A list of some of the major bands affected is attached to this letter. The Commission should not hinder operations of Federal systems in these bands, as Federal agencies must continue to use this spectrum to deploy the current systems and technologies they are developing.

Two bands of particular concern involve the proposed allocations at 94.7-95.7 and 139-140 GHz for commercial vehicular radar systems. These bands are in unique

³ See Notice, supra note 1, paras. 21, 22.

⁴ National Telecommunications and Info. Admin., U.S. Dept of Commerce, Special Publication 91-23, U.S. Spectrum Management Policy: Agenda for the Future 82 (Feb. 1991).

⁵ Notice, supra note 1, para. 11

⁶ Id. paras. 28, 32.

atmospheric transmission windows centered at 94 and 140 GHz, where Federal agencies have invested in applications such as high-powered radar systems. These bands must remain accessible to Federal agencies. Also, spectrum sharing in these bands is difficult, due to "safety of life" considerations associated with commercial vehicular radar systems. However, because the commercial vehicular radars require relatively short transmission distances, unlike many Federal applications, they can operate in frequencies with higher attenuation at the edges of the transmission windows. Therefore, the Commission should consider allocating the 99-100 and 134-135 GHz band segments for commercial vehicular radar systems to enhance compatibility with high-powered Federal radar systems.

Second, the Commission's proposal to license spectrum for non-Federal Licensed Millimeter Wave Services in bands shared by Federal and non-Federal users requires more detailed consideration by the Commission and Federal agencies. These new Commission licensees must share the spectrum with Federal users. Federal and non-Federal sharing may not be feasible for certain applications. It is therefore imperative that rules be in place to ensure that the new spectrum users know and respect the shared nature of the allocation. These rules are especially important given the Commission's proposal to assign non-Federal licenses using auctions.⁷ It must be clear to bidders at an auction that the licenses they obtain will be conditioned upon sharing with Federal users.⁸ The Commission's license to the non-Federal users cannot grant exclusive use of spectrum shared with Federal users.

Third, the Commission should ensure that unlicensed users do not, in effect, preclude spectrum sharing in bands currently set aside for shared Federal and non-Federal use.⁹ The use of large numbers of non-Federal unlicensed devices would make it difficult or impossible for Federal agencies to effectively use spectrum allocated on a shared basis. The FCC recognizes that sharing between unlicensed devices and licensed services in these bands is difficult.¹⁰ The potential effects of the Commission's proposal would be significant. Further discussions among the Commission, NTIA, and other Federal agencies with interest in these bands are appropriate to address these concerns.

Finally, both NTIA and the Commission should closely monitor the ongoing development of international allocations and technical standards for spectrum above 40 GHz, and proceed accordingly. U.S. firms will become more competitive in global markets, with ensuing benefits for the public, if U.S. spectrum allocations and technical standards are in harmonization with the international marketplace. Furthermore, when considering technical

⁷ *Id.* paras. 26-27. The Commission is allowed to auction spectrum only where the principal use of the spectrum involves certain commercial uses, as specified in Section 309(j) of the Communications Act, as amended, 47 U.S.C. § 309(j) (Supp. V 1993).

⁸ *See* 47 U.S.C. § 309 (j)(6)(D) (Supp. V 1993); *see also id.* § 309 (j)(6)(A)-(C) & (E).

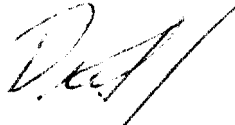
⁹ *See* Notice, *supra* note 1, paras. 13-19, 29-32, 38-46.

¹⁰ *Id.* para. 19.

standards, NTIA urges the Commission to encourage emissions and susceptibility standards that enhance spectrum sharing and compatibility among systems, including Federal systems.

Thank you for your consideration of these issues. I will be contacting you shortly to arrange a meeting to discuss these matters.¹¹ In addition, NTIA and the Federal agencies may further address these issues and provide additional views later in this proceeding.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. Parlow', with a long horizontal stroke extending to the right.

Richard D. Parlow
Associate Administrator
Office of Spectrum Management

¹¹ We note that NTIA is exempt from the Commission's ex parte requirements when making a presentation involving matters over which NTIA and the Commission share jurisdiction, such as issues involving spectrum shared by Federal and non-Federal users. See 47 C.F.R. § 1.1204(b)(5); see also 2 FCC Rcd 3018, paras. 53-54.

ATTACHMENT

MAJOR CURRENT AND PLANNED FEDERAL GOVERNMENT USE OF THE 40 - 153 GHz BANDS ¹

<u>Agency</u>	<u>Band (GHz)</u>	<u>Application</u>
Department of Commerce/ National Oceanic and Atmospheric Administration	60.3 - 61.3	Environmental Satellites
	91.65	Special Sensor Microwave/Imaging Sounder
	111 - 125	Temperature Sounding (Passive-Geostationary)
	140	Window to the Earth Surface
	148.5 - 151.5	Moisture Sounding (Passive)
Department of Defense	42.5 - 45.5	Satellite Uplinks
	59 - 64	Data Links (Airborne and Terrestrial) and Inter-Satellite Links
	71 - 72	Cross Section Measurement
	92 - 97 ²	Radars (Tracking, Seeking, Passive Radiometers)
	139 - 140	Radars (Tracking and Navigation)
Department of Transportation	60	Intelligent Vehicle Highway Systems (IVHS)
	76 - 77	IVHS
	90	IVHS
Federal Aviation Administration	70	Radar (Inclement Weather Guidance System)
	90	Radar (Inclement Weather Guidance System)
National Aeronautics and Space Administration	50 - 58	Environment Remote Sensing (Passive)
	59 - 64	Advanced Tracking and Data Relay Satellite System
	60.3 - 61.3	Environment Remote Sensing (Passive)
	86 - 92	Environment Remote Sensing (Passive)
	94 - 95	Environment Remote Sensing (Active)
	116 - 126	Environment Remote Sensing (Passive)
	150	Environment Remote Sensing (Passive)

1. This table is not a complete list of all current and planned Federal government uses of these bands; only certain major uses are described here.

2. The Department of Defense is also developing quasi-optical gyrotrons for material processing (80-120 GHz), wideband traveling wave tubes for electronic countermeasures (80-100 GHz), and pulsed and continuous wave signals (80-110 GHz) to evaluate dual receiving systems.